

National Earthquake Hazards Reduction Program

... a research and implementation partnership

Program Update

MCEER Annual Meeting Presentation
June 29, 2006



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Presentation Outline

- General background
- P.L. 108-360 overview
 - Statutory program activities
 - Agency roles
 - Technical priorities
 - Leadership/management/budget issues
- Stakeholder inputs
- Conclusions



Background

- NEHRP was initially established by P.L. 95-124, the Earthquake Hazards Reduction Act of 1977.
- NEHRP is Federal Government's long-term program to reduce U.S. earthquake risks to life and property.
- NEHRP authorizes appropriation levels for the four principal agencies – FEMA, NIST, NSF, USGS.
- Congress typically reviews and reauthorizes NEHRP every 2-3 years.



P.L. 108-360

NEHRP Reauthorization Act of 2004

Overview

- Enacted 25 October 2004.
- Followed thorough two-year review of NEHRP, including hearings by House Science Research Subcommittee and Senate Space, Science, and Transportation Subcommittee.
- Recognized that new mitigation technologies are being implemented slowly, while urban development has accelerated, resulting in significantly increased societal vulnerabilities.
- Reauthorized NEHRP for FY05-FY09 at average annual totals of about \$180M per year (an increase of \$75M per year from previous levels).



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PL 108-360: **Statutory Program Activities**

- **Develop effective measures for earthquake hazards reduction.**
- **Promote adoption of earthquake hazards reduction measures** by Federal, State, & local governments; national standards & model code organizations; architects and engineers; building owners, and others with a role in planning and constructing buildings, structures, and lifelines through:
 - grants, contracts, cooperative agreements, and technical assistance;
 - developing standards, guidelines, and voluntary consensus codes for earthquake hazards reduction for buildings, structures, & lifelines;
 - developing and maintaining a repository of information, including technical data, on seismic risk & hazards reduction.
- **Improve understanding of earthquakes and their effects** on communities, buildings, structures, and lifelines, through **interdisciplinary** research involving engineering, natural sciences, and social, economic, and decisions sciences.
- **Develop, operate, and maintain Advanced National Seismic Research and Monitoring System; George E. Brown, Jr. Network for Earthquake Engineering Simulation; and Global Seismographic Network.**

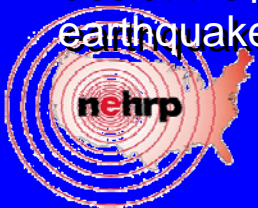


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PL 108-360: **NEHRP Agency Roles** (1/9)

Department of Homeland Security, Federal Emergency Management Agency (FEMA):

- **Promote** (with NIST) **implementation of research results** by working closely with national standards and model building code organizations.
- **Promote better building practices** within the building design & construction industry (architects, engineers, contractors, builders, & inspectors).
- **Operate program of grants & assistance** to enable States to develop mitigation, preparedness, & response plans; prepare inventories & conduct seismic safety inspections of critical structures & lifelines; update building & zoning codes & ordinances to enhance seismic safety, increase earthquake awareness and education, and encourage development of multi-state groups for such purposes.
- **Support implementation of comprehensive earthquake education and awareness program**, including development of materials and their wide dissemination to all appropriate audiences and support public access to locality-specific information that may assist the public in preparing for, mitigating against, responding to, and recovering from earthquakes and related disasters.



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PL 108-360: **NEHRP Agency Roles** (2/9)

Department of Homeland Security, Federal Emergency Management Agency (FEMA), cont'd:

- Assist NIST, other Federal agencies, & private sector groups, in the preparation, maintenance, & wide dissemination of seismic resistant design guidance and related information on building codes, standards, and practices for new and existing buildings, structures, and lifelines; & aid in the development of performance-based design guidelines & methodologies supporting model codes for buildings, structures, & lifelines that are cost-effective and affordable.
- Develop, coordinate, & execute the National Response Plan when required following an earthquake, & support the development of specific State and local plans for each high risk area to ensure the availability of adequate emergency medical resources, search & rescue personnel & equipment, & emergency broadcast capability.



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PL 108-360: **NEHRP Agency Roles** (3/9)

Department of Homeland Security, Federal Emergency Management Agency (FEMA), cont'd:

- Develop approaches to combine measures for earthquake hazards reduction with measures for reduction of other natural and technological hazards, including performance-based design approaches.
- Provide preparedness, response, and mitigation recommendations to communities after an earthquake prediction has been made.
- Enter into cooperative agreements or contracts with States & local jurisdictions, and other Federal agencies to establish demonstration projects on earthquake hazard mitigation, to link research & mitigation efforts with emergency management programs, or to prepare educational materials for national distribution.



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PL 108-360: **NEHRP Agency Roles** (4/9)

National Institute of Standards and Technology (NIST):

- **Serve as Lead Agency** – primary responsibility for planning & coordinating the program.
 - **Ensure that program includes necessary steps to promote implementation of earthquake hazard reduction measures** by Federal, State, and local governments, national standards & model building code organizations, architects and engineers, and others with roles in planning & constructing buildings & lifelines.
 - **Support development of performance-based seismic engineering tools**, & work with appropriate groups to **promote commercial application** of such tools, through earthquake-related building codes, standards, and construction practices.
 - **Request assistance of Federal agencies other than the Program agencies, as necessary to assist in carrying out the (Program).**
 - **Work with FEMA, NSF, & USGS, to develop a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches to the research infrastructure in a systematic manner.**



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PL 108-360: **NEHRP Agency Roles** (5/9)

National Institute of Standards and Technology (NIST), cont'd:

- Work closely with national standards and model building code organizations, in conjunction with FEMA, to promote implementation of research results.
- Promote better building practices among architects and engineers.
- Work closely with national standards organizations to develop seismic safety standards and practices for new and existing lifelines.
- Support development & commercial application of cost-effective and **affordable performance-based seismic engineering** by providing technical support seismic engineering practices & related building codes, standards, & practices development.



PL 108-360: **NEHRP Agency Roles** (6/9)

National Science Foundation (NSF):

- Fund (basic) research on earth sciences to improve understanding of causes & behavior of earthquakes, earthquake engineering, & human response to earthquakes.
- Encourage prompt dissemination of significant findings, sharing of data, samples, physical collections, & other supporting materials, & development of intellectual property so research results can be used by appropriate organizations to mitigate earthquake damage.
- In addition to supporting individual investigators, support university research consortia & centers for research in geosciences & in earthquake engineering.
- Work closely with USGS to identify geographic regions of national concern that should be the focus of targeted solicitations for earthquake-related research proposals.
- Support research that improves the safety & performance of buildings, structures, & lifeline systems using large-scale experimental and computational facilities of the (GEBJr) NEES & other institutions engaged in research & implementation of NEHRP.

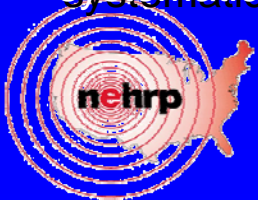


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PL 108-360: **NEHRP Agency Roles** (7/9)

National Science Foundation (NSF), cont'd:

- **Emphasize** in earthquake engineering research, **development of economically feasible methods to retrofit existing buildings and protect lifelines** to mitigate earthquake damage.
- **Support research that studies the political, economic, & social factors that influence the implementation of hazard reduction measures.**
- **Include to the maximum extent practicable diverse institutions, including HBCUs and those serving large proportions of (minorities) and other underrepresented populations.**
- **Develop in conjunction with FEMA, NIST, & USGS, a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches** to the research infrastructure in a systematic manner.



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PL 108-360: **NEHRP Agency Roles** (8/9)

U.S. Geological Survey (USGS):

- Conduct research & other activities necessary to characterize and identify earthquake hazards, assess earthquake risks, monitor seismic activity, and improve earthquake predictions.
- Conduct a systematic assessment of seismic risks in each region of the Nation prone to earthquakes, including, where appropriate, the establishment and operation of intensive monitoring projects on hazardous faults, seismic microzonation studies in urban & other developed areas where earthquake risk is determined to be significant, & engineering seismology studies.
- Work with officials of State & local governments to ensure that they are knowledgeable about specific seismic risks in their areas.
- Develop standard procedures, in consultation with the Director of FEMA and Director of NIST, for issuing earthquake predictions, including aftershock advisories.
- Issue, when necessary, and notify the Director of FEMA and Director of NIST, an earthquake prediction or other earthquake advisory, which may be evaluated by the National Earthquake Prediction Evaluation Council.
- Operate, using the National Earthquake Information Center (NEIC), a forum for the international exchange of earthquake information.



PL 108-360: **NEHRP Agency Roles** (9/9)

US Geological Survey (USGS), cont'd:

- Operate a National Seismic System (ANSS).
- Support regional seismic networks, which shall complement the National Seismic Network.
- Work with NSF, FEMA, & NIST, to develop a comprehensive plan for earthquake engineering research to effectively use existing testing facilities and laboratories, upgrade facilities & equipment as needed, & integrate new, innovative testing approaches to the research infrastructure in a systematic manner.
- Work with other Program agencies to coordinate Program activities with similar earthquake hazards reduction efforts in other countries.
- Maintain suitable seismic hazard maps in support of building codes for structures and lifelines, including additional maps needed for performance-based design approaches.



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PL 108-360: **NEHRP Agency Roles** (8/8)

Additional notes on agency roles:

- NSF & USGS jointly support the Global Seismographic Network (GSN) to provide real-time seismic monitoring for earthquake detection and tsunami warning.
- NSF also supports its Earthscope project as a related non-NEHRP activity.



PL 108-360: **Major Technical Priorities**

Congress strongly endorsed the priorities identified in the 2001-2005 NEHRP Strategic Plan, which was developed in partnership with the stakeholder community (private sector, state & local governments, & academia), including:

- Development and commercial application of performance-based seismic engineering tools, codes, standards, and practices (FEMA, NIST).
- Completion of USGS Advanced National Seismic System (ANSS).
- Operation and maintenance of and conduct of research using NSF George E. Brown, Jr., Network for Earthquake Engineering Simulation (NEES).
- Operation and maintenance of Global Seismographic Network (GSN) by USGS & NSF.



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PL 108-360:

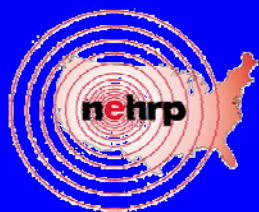
Major Leadership & Management Priorities

- Establishes Interagency Coordinating Committee.
- Establishes Advisory Committee on Earthquake Hazards Reduction.
- Designates NIST as NEHRP Lead Agency.
- Mandates updated Strategic Plan.
- Mandates Management Plan.
- Mandates coordinated Interagency Budget and Annual Report to Congress.



Interagency Coordinating Committee (ICC)

- Composed of directors of FEMA, NIST (**Chair**), NSF, & USGS, Office of Science & Technology Policy (OSTP), and Office of Management & Budget (OMB).
- Purpose: Oversee planning, management, & coordination.
- Responsible for developing and updating strategic and management plans, coordinated interagency budgets, and annual program reports.
- Status:
 - Held 1st ICC meeting April 6, 2006 — **very positive, with strong leadership consensus on way ahead.**
 - Next planned meeting to be in July 06.



Advisory Committee on Earthquake Hazards Reduction (ACEHR)

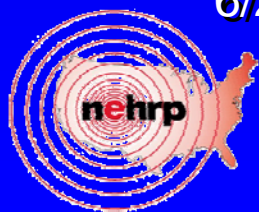
- Purpose: Assess trends and developments in science and engineering; program effectiveness; need for program revision; and program management, coordination, and implementation activities.
- Composition: At least 11 qualified members (no Federal employees) representing research and academic institutions, industry standards development organizations, state & local governments, and financial communities.
- Congressional direction:
 - ACEHR to report to NIST Director annually on its assessments.
 - ACEHR to consider recommendations of USGS Scientific Earthquake Studies Advisory Committee (SESAC).
 - ACEHR to have flexibility to report to Congress on program-related issues.



Advisory Committee on Earthquake Hazards Reduction (ACEHR)

Current Activities

- Approach:
 - 11-15 members.
 - Ex-officio role of USGS SESAC Chair.
 - First 11 members to be on staggered 1, 2, and 3-yr terms.
 - Future members on 3-yr terms.
 - Public solicitation of nominations.
 - NIST Director to appoint committee from nominations received, in consultation with other agency directors.
- Status:
 - ICC approved moving ahead on 4/6/06.
 - Committee charter and membership solicitation approved by DoC on 6/27/06 – now in process of final staffing and filing.



Strategic Plan

- 2006-2010 edition planned to be evolutionary, keying on FEMA 383, *Expanding and Using Knowledge to Reduce Earthquake Losses: The National Earthquake Hazards Reduction Program Strategic Plan, 2001-2005*.
- NEHRP agencies to use stakeholder inputs to update FEMA 383, creating new 2006-2010 Strategic Plan, paralleling current reauthorization, which budgets through FY09.
- Following initial draft of updated plan, community comment period will be provided, plan will be updated, reviewed by ACEHR, finalized, and released.
- Status:
 - ICC approved this approach on 4/6/06.
 - Successful stakeholder discussion session held at Quake '06.
 - Stakeholder inputs received via web during May 06 – **more on this at the end of the presentation.**
 - Based on stakeholder inputs, likely revolutionary plan to be developed for FY10 and beyond.



Management Plan

- Largely an “internal” document to govern NEHRP operational activities.
- Annual plan to be developed as a cooperative effort among agencies.
- Plan will cover upcoming and following fiscal years.
- Key features:
 - Program milestones and performance metrics.
 - Milestones to implement Strategic Plan.
 - Milestones to fulfill statutory requirements (ICC, ACEHR, Annual Report, Consolidated Budget).
 - Milestones to operate NEHRP Secretariat.
- Status:
 - ICC approved this approach on 4/6/06.



Coordinated Interagency Budget

- Ensures appropriate balance among “program activities” and consistent budget reporting to Congress.
- Coordinated NEHRP budget to be submitted to OMB at time established by OMB for agencies to submit annual budgets.
- Key issues:
 - Ensure budget requests are consistent with priorities in the NEHRP Strategic Plan and Administration Priorities, considering funding levels authorized by Congress.
 - Ensure integrity of budget data with NEHRP goals and objectives: develop and use consistent criteria and activity-based data reporting format for informing Congress and stakeholders.
 - ICC to provide guidance to program agencies on preparation of budget requests (Senate Report 108-385): develop process for program-wide setting and coordination of budget priorities and plans, in addition to coordinated budget reporting.



Future Budget Planning

- Ensure consistency with Administration priorities established through work of NSTC Subcommittee on Disaster Reduction:
 - Grand Challenges for Disaster Reduction, June 2005.
 - Grand Challenge Implementation Plan for Earthquakes (Draft), June 2006 – in review.
- Honor priorities in NEHRP Strategic Plan (endorsed by Congress in the NEHRP Reauthorization Act of 2004).
- NIST assigns priority to implementing industry R&D roadmap, ATC-57, *The missing piece: improving seismic design and construction practices*, to narrow the “research-to-practice gap” (<http://www.nehrp.gov/info/ATC57.pdf>). All work will also be closely coordinated with FEMA.
- NSF assigns priority to NEES research and O&M to reflect the National Science Board-approved five-year cooperative agreement.
- USGS assigns priority to improve the use of USGS information to reduce loss of life and property from catastrophic natural hazards including earthquakes.



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P.L. 108-360

NEHRP Authorized Budgets

Agency / Initiative	\$M				
	FY05	FY06	FY07	FY08	FY09
FEMA	21.0	21.6	22.3	23.0	23.6
NIST	10.0	11.0	12.1	13.3	14.6
NSF	38.0	39.1	40.3	41.5	42.8
NSF NEES O&M	20.0	20.4	20.9	21.4	21.9
USGS	77.0	84.4	85.9	87.4	88.9
<i>(Including not less than for ANSS)</i>	<i>(30.0)</i>	<i>(36.0)</i>	<i>(36.0)</i>	<i>(36.0)</i>	<i>(36.0)</i>
NEHRP Totals	166.0	176.5	181.5	186.6	191.8

These funding levels have been **authorized** but **not** specifically **appropriated** by Congress.



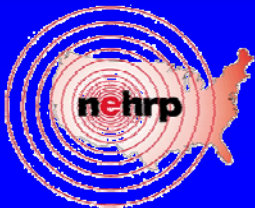
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NEHRP Actual/Estimated Budgets

Agency / Initiative	\$M				
	FY05 Actual	FY06 Enacted	FY07 ⁵ Requested	FY08	FY09
FEMA	14.7 ²	9.5 ³	TBD ⁴	TBD	TBD
NIST	0.9	0.9	1.7	TBD	TBD
NSF <i>(Includes NEES O&M)</i>	53.1	53.8	54.7	TBD	TBD
USGS <i>(including ANSS)</i>	50.9 ¹	50.6	51.5	TBD	TBD
USGS GSN	7.5 ¹	3.9	3.9	TBD	TBD
NEHRP Totals	127.1 ²	118.7 ³	TBD	TBD	TBD

Notes:

1. Includes funds for tsunami warning from emergency supplemental appropriation (\$3.95M for EHP, \$4.15M for GSN).
2. FEMA FY05 actual budget covers program activities & S&E, but excludes state grants that are administered by DHS Preparedness Directorate.
3. FEMA FY06 enacted budget covers program activities, but excludes S&E and state grants that are administered by DHS Preparedness Directorate.
4. Estimate of NEHRP FEMA allocation from anticipated total DHS appropriation not yet available.
5. Requested FY07 budgets based on President's FY07 budget submission to Congress.



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May 06 Stakeholder Inputs (1/2)

- Important to establish performance metrics.
- Improved program integration is needed.
- Improve program-wide funding, research, and implementation balance.
- Emphasize community-wide disaster resilience.
- Differing opinions on research-to-practice / “codification.”
- Increase emphasis on lifeline issues.
- Differing opinions on PBSD.
- Improved communications (both ways – education/outreach and stakeholder inputs) are needed.
- Place multi-hazard emphasis on research and implementation.
- Embed the social sciences in all aspects of program.
- Establish national repository for earthquake data.



May 06 Stakeholder Inputs (2/2)

- NEHRP agencies very much appreciate and respect the great response!
- Process for NEHRP to address inputs:
 - “Point-by-point” response not planned.
 - Appropriate agencies designated to consider each input comment.
 - Inputs to be respectfully considered and used to formulate revised Strategic Plan for 2006-2010, as well as for setting directions for future (2010-2015) strategic plan development.



Conclusion

- 2004 Reauthorization of NEHRP was watershed event.
 - Congress required program changes that increase interagency coordination, and, therefore, cooperation – **Congress wants the whole of NEHRP to be more than the simple sum of its parts.**
 - Congress mandated higher level and broader federal agency involvement through the creation of ICC and ACEHR.
- The 2004 reauthorization presents an opportunity to facilitate interagency **synergies** that are needed to reduce the Nation's vulnerabilities to future major earthquakes even more effectively than in the past!
- Stakeholder interaction is a “must!”

Go to **<http://www.nehrp.gov>** !



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